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ORIGINAL ARTICLES.

THE INDICATIONS FOR IRIDECTOMY IN GLAUCOMA AND THE METHOD OF OPERATING.*

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I AM well aware that what I shall have to say here to-night has been said a great many times, and said better, ever since Albrecht v. Graefe's first paper on Glaucoma was published in 1857, and I should not have written this paper had I not received an urgent request from our chairman to do so.

The subject assigned to me by our chairman is:

1. The Indications for Iridectomy in Glaucoma.
2. The Method of Operating.

I shall follow the usual practice of dividing glaucoma in:

1. The Acute Inflammatory or Congestive form;
2. The Chronic Inflammatory or Congestive form; and
3. Simple Glaucoma.

I may say right here that in the latter class I include only cases in which an *appreciable increase of tension*, even if only for a short period, is present in addition to the excavation of

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the optic nerve entrance and the other symptoms commonly recognized as belonging to this affection.

Iridectomy is indicated in acute congestive glaucoma as long as there is perception of light, and even for some days after complete blindness has set in.

Iridectomy is the remedy par excellence in this disease; it has stood the test of time, and the world owes a great debt of gratitude to the late v. Graefe for its discovery. While it is true, as v. Graefe found, that we may have a good result if the operation is made within a fortnight after the outbreak of the attack, it is advisable to perform the operation as soon as possible after the diagnosis is made. Some surgeons hesitate to operate during the premonitory stage, if the other eye is sound, but I cannot see that anything is gained by delay; the acute attack is pretty sure to come or the affection will gradually pass over into the chronic form of the disease. The earlier the operation is done in this disease the better will be the result.

Like other remedial measures, iridectomy has its limitations even in this form of glaucoma. It cannot restore the loss of sight and the contraction of the visual field, that are due to anatomical changes in the optic nerve produced by long continued or very rapidly increased intraocular pressure; all it can do is to remove the turbidity of the media and ischæmia of the retina due to increased pressure.

If both eyes are suffering from acute congestive glaucoma at the time the patient is first seen, the question arises, shall we operate both eyes at the same time or shall we operate only one; and if only one, *which*—the better or the worse? Most operators of experience regard it as bad practice to operate both eyes at the same time, as it is well known that the predisposition to chorio-retinal hemorrhage and to malignant glaucoma exists almost always in *both* eyes. The safest plan is undoubtedly to operate first on the worst eye and if all goes well to operate the other some days later. I have been obliged to operate on both eyes at the same time and have had no reason to regret doing this. My practice has been in cases in which both eyes were affected, when first seen, to instill a ½ per cent. solution of eserine several times, and if a marked contraction of the pupil follows in one eye, but not

the other, to operate first on the one *least* affected by the eserine and on the other several days later. If the eserine has had *no* effect on *either* eye, I have administered a general anæsthetic and operated on *both* eyes at the same time. It is a well-known fact that soon after an iridectomy in acute inflammatory glaucoma, the other eye, which was apparently sound when first operated on, becomes attacked by the same disease. This occurred in several of my cases in former years. In most of these the symptoms subsided under eserine for a time. In the cases which did not yield to this drug I operated at once. For several years I have instilled eserine in the sound eye before the operation, and during the time the patient was in bed, and since then I have had no case in which the good eye was attacked while the patient was under treatment. Although months and even years may elapse before the second eye is attacked, it very seldom escapes entirely. With this fact in view, together with the fact that it is much easier to make a satisfactory iridectomy on the sound eye than on one that has glaucoma, some of the German surgeons do not hesitate to advise an iridectomy on the *still healthy eye* before even the premonitory stage is present. Commenting on this fact, Czermack, in his book, "Die Augenärztlichen Operationen," seventh part, page 762, 1898, says: "One can also advocate a prophylactic iridectomy on an eye that shows merely signs of a *disposition* to glaucoma—that is, if it has a markedly shallow anterior chamber *and the other is suffering or has already suffered from glaucoma.*" More recently Dr. De Schweinitz has plead for a prophylactic iridectomy under the same circumstances in a paper which he read before the American Ophthalmological Society in 1901.

Bearing in mind the accidents that have happened to me and others in eye operations, I should hesitate to urge upon my patients a prophylactic iridectomy unless they were obliged to go to some remote region where competent help could not be had.

In the chronic inflammatory glaucoma, iridectomy is indicated as long as fair vision exists in the eye, and the contraction of the field of vision is not great. I regard iridectomy as the best remedy we have for this form as well as in the acute, though the result obtained by it is, at best, the arrest of

the disease. Much will depend on the degree of degenerative changes in the optic nerve present at the time of the operation. If cloudiness of the media exists at the time of the operation, the impairment of sight due to this will of course be removed and considerable improvement in vision will be the result. In many cases of this form we cannot hope for a permanent reduction of the increased tension and for more than a retardation of the progress of the disease. In a very few of the chronic form the sight is made worse by the operation. In cases in which the sight was much impaired, the defect of the visual field approached the point of fixation and the excavated papilla was of atrophic appearance, total blindness has sometimes followed the operation. It is also in this form of the disease that the so-called malignant glaucoma is most frequently developed a short time after the performance of the iridectomy. That this dreaded condition is not, however, the result of the iridectomy but is due to the state of the eye, although we know of no sign by which it can be recognized before hand, is shown by the fact that it always occurs also in the other eye if this is operated on for the same disease, whether the operation is an iridectomy or a sclerotomy. In one of Schweigger's cases in which malignant glaucoma followed the iridectomy, the other eye developed an attack of glaucoma seventeen years later, he made a sclerotomy, and this was also followed by malignant glaucoma. Such cases are fortunately very rare, and should not prevent us from giving patients with the chronic form the benefit of an iridectomy, remembering that the disease, if left to itself, ends in absolute blindness.

In glaucoma simplex, iridectomy is indicated if the eye shows an appreciable increase of the intraocular tension, central vision is good and the visual field is not much contracted. It is at present quite generally held that iridectomy is least effective in this form of glaucoma, and some of the ophthalmologists regard it as entirely useless. It must be admitted that the operation here never restores the vision that has been lost, or restores the field of vision; all we can hope for is to arrest the disease and to restore the normal intraocular tension. And even *this* the operation not infrequently fails to accomplish if the atrophy of the optic nerve has proceeded

too far. There is, however, no doubt in my mind that in many of my cases in which I was permitted to operate in the early stage of the disease, the operation arrested the progress of the disease for many years; and what other remedial measures have we that will do as much? I know of none. I have tried sclerotomy and myotics, but the results were so discouraging that I now advise my patients not to waste precious time with myotics, but to submit to the operation so long as the vision is fairly good and the visual field is only moderately contracted. And if the first operation fails to arrest the progress of the disease, I have sometimes made another iridectomy beside the first one, a few months later. We know that simple glaucoma sooner or later leads to total blindness. How soon we cannot tell, and we cannot, therefore, positively say that an operation has hastened or delayed this catastrophe. If, as seems probable under the use of myotics, fifteen years may elapse from the time of the appearance of the disease until great impairment is evident, as is stated by an eminent ophthalmologist, from personal experience, then we have less ground than ever to assume that the operation has *really* been of benefit to the disease. I do not think that I have ever seen a case of glaucoma in which, without the operation of iridectomy, sight was not lost in much less time. Some impairment of vision is unavoidable, even in our most successful cases, and is due to the large coloboma and the corneal astigmatism resulting from the operation.

Malignant glaucoma has also followed this operation in a small number of cases of simple glaucoma, but the cases are fortunately so rarely met with that they should not prevent us from operating. If both eyes require the operation it is best to do here as in the other forms of glaucoma already discussed, to operate first the worst eye even if it is totally blind, and, if malignant glaucoma does not develop, to operate the other. In the cases in which there is much contraction of the visual field when first seen, I explain to my patients or their friends the natural history of the disease, the chances of arresting the progress of the disease by the operation, the *possibility* of disastrous result following it, and leave to them the decision as to what shall be done.

Secondary Glaucoma.—A partial staphyloma of cornea,

simple ectesia of the cornea, exclusion of the pupil, swelling of the lens, dislocation of the lens in anterior chamber or the vitreous chamber, intraocular hemorrhage, and intraocular neoplasms may all give rise to an increase of intraocular tension. In exclusion of pupil and partial corneal staphyloma, an iridectomy will reduce the tension, but in the other conditions named it is useless. Glaucoma hemorrhagica is a touch-me-not to most surgeons. Schweigger is about the only one who thinks that an iridectomy is often of service in such cases.

Method of Operating.—To make a large and clean iridectomy in this disease, with much chemosis, a very shallow anterior chamber and a widely dilated pupil, is one of the most difficult tasks the ophthalmic surgeon is called upon to do. If great chemosis is present and the pupil can be contracted by eserine it will be sometimes to the best interests of the patient to delay the operation till the chemosis has somewhat subsided.

A general anæsthetic will be required in many cases of the acute and chronic inflammatory cases, though the subconjunctival injection of cocaine and eucaine are said to produce sufficient insensibility to permit of an accurate operation. Instillation of cocaine or holocaine even if combined with solution of the extract of suprarenal glands rarely reduces the sensibility sufficiently in these cases. In simple glaucoma it is almost always practical to operate under local anæsthesia.

Cleansing the eyelashes and the brows and the skin of the lids, and flushing the conjunctival sac with sterile water or physiological salt solution should precede the operation. Only sterile instruments should be used.

I do not remember a single case of my own in which suppuration of the wound followed the operation, but it is best to be clean.

Unless the iris is more disorganized here than elsewhere the iridectomy should be made upward, so that the coloboma lies under the upper lid. I nearly always use a narrow cataract knife for the incision, enter the sclera about one mm. from the clear corneal margin and make the counter puncture at a corresponding point. The section should have a length of 8 mm. In cutting *out*, the edge of the knife is turned

slightly forward, but should come out in the sclera and make the conjunctival flap as narrow as possible. In cases of very narrow shallow anterior chamber it is not always practical to make an incision of this length and one must be satisfied with a smaller one.

The iris is seized at about the middle of its width, drawn straight out, and cut close to the lips of the wound by two or three successive strokes of the scissors, first close to one end of the incision, then at the middle, and last at the other end. If the sphincter corners do not return to their natural position, a blunt probe should be carefully introduced into the anterior chamber to disengage the incarcerated iris from the angles of the wound. Rubbing the adjacent cornea will accomplish this only rarely. Some surgeons prefer to make the incision with a broad lance-shaped knife and to tear the iris from its root. I have tried both, but have given them up again. Priestly Smith makes a posterior sclerotomy immediately before making the iridectomy, which he thinks facilitates the making of a good incision, diminishes the immediate risk which attends it and obviates the forcible displacement of the lens forward, which sometimes annihilates the effects of a good operation. He is under the impression that his results have been decidedly better than could have been obtained by iridectomy alone. If not employed as a preliminary step, he advised this operation also immediately after the iridectomy, if the tension of the eye is found sufficiently reduced.

Posterior sclerotomy can be performed with the aid of cocaine only, even in congestive cases. "The patient turns his eye inward so as to expose the outer part of the sclera. The surgeon taking a v. Graefe knife in one and forceps in the other, seizes the conjunctiva near the horizontal meridian and slides it downward a little over the sclera. He then punctures the sclera on the horizontal meridian at a point at least five mm. from the margin of the cornea, keeping the back of the knife toward the cornea, and the point directed toward the center of the globe so as to avoid touching the posterior pole of the lens." De Wecker thinks that the failure of the iridectomy is mostly due to incarceration of the iris in the angles of the wound, caused by increased intraocular pressure, and suggests that an anterior sclerotomy downwards be made

shortly before the iridectomy, which can then be more perfectly done afterwards. I have always succeeded in making at least a small iridectomy under the most unfavorable circumstances and have later on made another beside the first one.

In simple glaucoma there is usually no great difficulty in making a large and peripheric iridectomy. At least one-fifth of the iris should be excised down to its ciliary insertion, and special care must be taken to prevent incarceration of the iris at the corners of the wound.

If a repetition of the operation is required it is best to make the second beside the first iridectomy, provided the iris is not disorganized here more than elsewhere. In many cases the anterior chamber is not restored for several days after the operation; this is no bad significance, provided there be no œdema of the lids and pain in the eye. The patient should be kept in bed until the wound is closed.

A peculiar mode of union of the incision, called by v. Graefe cystoid cicatrix, is occasionally met with. In these cases the lips of the wound are separated by a web of cicatricial fibres, which by the intraocular pressure are bulged out like small vesicles. Occasionally these fibres give way and the aqueous escapes under the conjunctiva. A cystoid cicatrix is always a source of danger, as it will permit the entrance of pathogenic micro-organisms into the eye. If large they should be treated as iris prolapses, by excision or cauterization.

Of the *accidents* during the performance of iridectomy wounding the iris and lens capsules are most frequent. If the point of the knife becomes engaged in the tissue of the iris slight lateral and forward movements will usually disengage it. If not successful in this, the knife must be withdrawn and the wound be enlarged with a fine pair of curved scissors. The anterior capsules may be wounded by the point of the knife, by pressure of the back of the knife through the iris intervening, by the iris forceps, during manipulation to reduce the incarcerated iris in the angles of the wound, or by the sudden advance of the lens through the sudden reduction of pressure. The development of cataract in a glaucomatous eye is fraught with the gravest consequences, and extraction

of the lens is usually necessary. In one of my earliest cases of acute inflammatory glaucoma, a woman about 50 years of age, whose right eye had been lost years before from the same disease, I discovered a week after the iridectomy that cortical lens matter was coming through the wound in the upper part of the lens. I was not aware that I had wounded the lens. The development of the cataract was not attended by any appreciable increase of intraocular tension. Two weeks after the operation the anterior chamber was full of lens matter. Projection was perfect. I was not permitted to make simple extraction. At the end of three months the whole lens, nucleus included, had been absorbed and vision was $^{20}/_{60}$ with the proper glass. The woman when I last saw her, more than thirty years after the operation, was still able to read the newspaper, and was very grateful for what I had done for her. I have related this case for the encouragement of those who may have the same misfortune of wounding the lens.

Retino-choroidal hæmorrhage occurs fortunately very seldom after an iridectomy. In the cases reported, the lens, vitreous body, and retina were forced out of the wound, and enucleation became necessary. Hæmorrhage in the retina or vitreous body was in most cases present *before* the operation.

The so-called malignant glaucoma has occurred mostly after iridectomy for chronic inflammatory glaucoma and glaucoma simplex. As I have before said, we know of no sign by which we can recognize a predisposition to this condition beforehand. Great pain, lachrymation, swelling of the lids, chemosis of the ocular conjunctiva, set in some hours after the iridectomy. The lens blocks the wound, the anterior chamber is absent, and tension is greatly increased. Whatever vision there was is soon totally destroyed. Weber has suggested a method for relieving this condition; it is to be done as soon as the iridectomy wound has closed. A lance-shaped knife enters the sclera in the horizontal meridian about 8 to 10 mm. from the outer margin of the cornea and is then turned on its axis about a quarter, so as to make the wound gap. Then gradually increasing pressure is made through the lid or with a Daviel spoon on the cornea directly backwards and the lens pressed back in its place. The maximum pressure is made

from one to one and a half minute, to permit the accumulation of the aqueous humor. I do not know of a single case in which this manœuvre succeeded. Enucleation was necessary in all for the relief of the pain. The free use of the salicylate of sodium has in the hands of a few relieved the pain and improved the sight.

Hæmorrhage in the anterior chamber is of frequent occurrence after iridectomy, and does not interfere with the healing process.

Prolaps of vitreous is not often seen during the operation, and its occurrence does not seem to do much harm.

The after treatment pursued by me in the last few years has been very simple. I keep the patient in bed till the wound is closed. I place an aluminum shield over the operated eye, cleanse the eye daily with sterilized water and instill a drop of the atropin solution after each dressing. The other eye I leave open and instill one drop of a ¼ per cent. eserine solution in it once daily.

This plan is much more comfortable to the patient than the bandaging of both eyes, and the healing of the wound seems to progress as speedily as under the bandage.

PAMPHLETS RECEIVED.

"Report of a Case of Optic Neuritis," by W. B. Johnson, M.D.

"Memoir of William Fisher Norris," by Chas. A. Oliver, M.D.

"Otitic Sinus Phlebitis and Thrombosis," by J. E. Sheppard, M.D.

"A Case of Otitic Brain Abscess; Operation; Recovery," by E. B. Dench, M.D.

"Thirty-second Annual Report of the New York State School for the Blind. 1901."

"The Present Position of Ophthalmic Science and Art," by D. B. St. John Roosa," M.D.

"Sections of a Glioma of the Retina Stained by Mallory's Neuroglia Stain," by B. Pusey, M.D.

HETEROPHORIA AND RESULTING REFLEX NEUROSES.

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ALL oculists are familiar with many of the neuroses that may result from ametropia, and some are familiar with the ills resulting from heterophoria. We should bear in mind that not only is the ciliary muscle supplied with sensation by the fifth nerve, but all the recti and the obliques are likewise supplied. Strain on these muscles from heterophoria or ametropia will be reflected to any branch or connection of the fifth. As the fifth has connection with the pneumogastric, the organs supplied by the latter nerve may suffer, and dyspepsia, biliousness, constipation, palpitation of the heart, etc., may result.

Neuralgia of the face and neck,[1] pulling of the muscles in the back of the neck,[2] wry-neck,[3] ringing in the ears, clicking noise due to reflex action of muscles at orifice of Eustachian tube, catarrh of throat (reflex trophic disturbance), congested turbinates, hyperæmia and inflammatory conditions of retina, nausea,[4] dizziness,[5] agrophobia,[6] neurasthenia,[7] impaired nutrition of scalp (dandruff), acne over the area supplied by the fifth or any of its connections, hemianæsthesia, epilepsy,[8] chorea, hystero-epilepsy, epileptoid conditions,[9] laryngeal tiring in singing, feeling of chilliness or sleepiness on attempting to read or work, cold hands and feet, high arterial tension with low specific gravity of the urine, phosphaturia, styes,[10] neuritis,[11] glaucoma,[12] cataract,[13] feeling of obstruction in the throat and hawking without any obstruction being present, toothache (I knew of one case of toothache with great heterophoria; nearly all the teeth, good and bad, were removed with no benefit); sniffling, stenosis of os uteri,[14] inability to write in a straight line (due to declination of eyes), causing children to throw the weight of the body on one foot (declination of eyes), wrinkling of face muscles,[15] urticaria, formication, stoop-shoulders,[16] holding chin high,[17] small ulcers of tongue or gums (trophic disturbance through the fifth nerve). I have some reason to believe that hetero-

[1] [2] [3] [4] [5] [6] [7] [8] [9] [14] [15] [16] [17] George T. Stevens.

[10] [11] [12] [13] A. L. Ranney, *loc. cit.*

phoria—and ametropia also—may be a common cause of Bright's disease, although it will take an immense amount of the most careful and perfect work by the best operators to prove this.

One case that came under my observation had a very high grade of heterophoria, and urine showed urates, no tube casts, and specific gravity 1004-1008 for a long period. After several muscle operations the sp. gr. began to rise. After nearly all the operations were completed the sp. gr. rose to 1020, urea normal, no urates. The sp. gr. has remained for a year at 1020. Before operation the patient had numerous gouty symptoms such as small concretions in the auditory canal and in the pores of the skin on the back,* dandruff, etc. Since the operations all of these symptoms have vanished.

Many other symptoms might be here enumerated. I will now give notes on a few cases in my practice.

Case I.—Mrs. F., age 45, has L.H. 1°, exophoria 2°. I gave her + 1.5s ⌒ +, 5 cy 90° each eye for near and far. No relief. She has persistent headaches. I weakened her lenses; no relief. I did a tenotomy on the left sup. rectus and reset it. This produced orthophoria. Six weeks after no headache, a year after ditto. She can use her eyes without any fatigue.

Case II.—Miss M. R., age 11. Has chorea, constant pulling of head from one side to the other (this is no doubt synchronous with the efforts of the eye muscles to pull the eyes on a level), jerkings of hands and feet. Has 1° L.H. and 1½° exophoria. Atropia used and ametropia found R.E. + 2.75s. L + 2.75s. These glasses were given. No improvement in symptoms. Then + 2.s each were given, with very slight improvement in symptoms. Arsenic was given for some time; no improvement. Then I did a tenotomy on the left superior rectus and reset it. I got no hyperphoria or exophoria. Next day all jerking of the head had stopped and has never reappeared. Four weeks later she had gained twelve pounds in weight and her nervousness was all gone. Her face was bright and happy and the former expression of fear had disappeared. A year later she has

*J. Hutchinson Bowman Lecture, 1884.

orthophoria, is strong and healthy, has no nervousness, and is growing rapidly. She wears + 2.5 D sp. each eye.

Case III.—Mrs. W., age 39. Has ½° R.H. and 4° esophoria. Is afraid to walk on the street for fear of falling. Under atropia she requires R. + 1.25s ⌒ + .5 cy 60° L. 2s ⌒ + .25 cy 90°. She wore these with little relief. Then + .75s ⌒ + .5 cy 60° and + 1.s ⌒ .25 cy 90° were given, and they, too, gave little relief. Then I did a tenotomy on right superior rectus and reset it. Two months after I reset the left superior rectus and got no hyperphoria or esophoria. Six weeks later all dizziness was gone. She can go any place, do work, and dance, sew, read, etc., with perfect comfort. A year later she is entirely well and never has any of the old symptoms. She has orthophoria.

Case IV.—Miss C. R.H. ½, esophoria 6°. Feb., 1899. Under atropia R.E. + 2.5s ⌒ + 5 cy 90°, to E. + 2.25s ⌒ + .5 cy 90°. These worn for a year and considerable relief was given, but still very nervous. Is neurasthenic and says she "fears she will lose her mind."

July 4. Cut and reset internal rectus R.E.

Aug. 1. Reset left internus.

Aug. 25. Graduated tenotomy on inf. recti.

Oct. 24. Cut and reset left sup. rectus.

Nov. 20. Cut and reset sup. rectus right eye.

Dec. 3, 1901. Cut and reset outer tendon left eye. Has 1° esophoria and 1° L.H. Can read and sew with comfort, feels well and eats well, no dizziness, mind clear, gaining in weight. Will have to do one more operation.

Case V.—Miss E. W., age 11. Sept., 1898. Internal strabismus. Has chorea, also precocious menstruation (probably originating from nervous disturbance due to eye strain). Under atropine requires + 1.75 sp. each eye. Gave these, but they gave very little relief. Tenotomy on left internus Nov., 1898. Jan., 1899. No esophoria. Chorea gone but menstruation persists. Wears glasses. Never had any return of chorea. On neither side of family is there a history of precocious menstruation.

A SEPARATE GUMMA OF THE CARUNCLE AND OCULAR CONJUNCTIVA. REPORT OF A CASE WITH A COMPLETE BIBLIOGRAPHY APPERTAINING THERETO.

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SOMEHOW or other syphilitic lesions of the ocular adnexa and conjunctiva, especially when of the primary or tertiary variety, always attract a good deal of attention. The reason for this is the rather infrequency of their occurrence. Though the secondary and tertiary syphilitic lesions of the ocular structures, such as the cornea, sclera, iris, choroid, retina, lid, and optic nerve are not of every day occurrence, yet they occur more frequently than gumma of the conjunctiva or caruncle. However, a primary syphilitic chancre of the ocular conjunctiva is rare, and one of the caruncle has never been recorded. In addition we find in the literature that about thirty-five references to gumma of the conjunctiva have been recorded, while only one (Taylor, 1875)[28] of the caruncle has been reported. Though the vagaries of syphilis are many and the character of the lesions manifold, yet not one case has ever been reported which presented a distinct gumma of the caruncle and at the same time another arising from the conjunctiva in one and the same eye.

Such a case, however, has been noted, carefully studied, and is made a part of this paper.

A very careful research into the literature upon the subject of gumma of the caruncle has yielded only one case. This case is reported by Taylor,[28] and is quoted by Knies.[12] Though this case was reported in 1875, still no mention of another has been found in the literature at the disposal of the writer. And it is this apparent scantiness of such cases which led to the report of the one below.

A primary syphilitic lesion of the conjunctiva is more frequently observed than perhaps a like lesion of the palpebral edge. Chancre of the ocular conjunctiva is more frequently

seen abroad than in this country. On the other hand, a gumma of the lid is by far more frequent than a gumma of the conjunctiva. Weeks,[36] quoting Morrow, says that the gummata appear as small discrete tumors, varying in size from a pea to a bean. The majority of observers report more often on a single gumma than on multiple gummata of the conjunctiva.

E. L. Holmes[34] cited a case of syphilitic enlargement of the caruncle, but this occurred with a primary chancre of the conjunctiva; hence it could not be taken as a gumma. Though Holmes seemed inclined to consider the enlargement as gummatous, yet Hyde, who saw the case in consultation, pronounced it a primary lesion. Strange as it may seem, the preauricular glands in this case were enlarged. This glandular involvement is a constant and almost diagnostic symptom of gumma of the conjunctiva.

On the other hand, quite a number of cases are recorded in which there was a gumma—single or multiple—of the ocular conjunctiva. But only a few cases of gumma of the cornea or sclero-corneal juncture have been recorded (Mauthner,[20] Ring,[21] Walker[31]). In Zeissl's Lehrbuch der Syphilis, Mauthner speaks of a "keratitis punctata interstitialis" in connection with gumma of the sclero-corneal juncture. Perhaps in these cases there was a so-called syphilitic thickening, not unlike that appearing in the conjunctiva as a secondary manifestation.

Another variety of gumma of the conjunctiva is the so-called syphilitic blotch. These are small circumscribed areas, slightly elevated and not very vascular. These blotches, no doubt, are true gummata of a very peculiar character in so far as they appear more like an infiltration than anything else. Only a few cases of this nature have ever been reported—France,[9] Smee,[27] Wecker,[32] Hirschberg.[11] There seems to be a difference of opinion as to their vascularity. Smee maintains that they are vascular, while France and Hirschberg hold the opposite. This variance in the opinion may be ascribed to the time of the observation of the gumma. Apparently the more recent blotches are more vascular than the ones of longer standing. France says they are very protracted unless energetically treated, which is true of any tertiary lesion of the conjunctiva.

Lastly gumma of the conjunctiva, *i. e.*, ocular portion does not seem to be such a very rare clinical observation. However, Swan M. Burnett,[35] in Norris and Oliver's System of Eye Diseases, makes this very pointed remark: "At least one case has been reported in which a true gumma had its seat in the conjunctiva." Even Hirschberg[11] makes the following statement: "Conjunctivitis gummosa hat bisher in der Literatur nur eine geringe Berücksichtigung gefunden." These two statements naturally need to be taken with some latitude, for careful research will not uphold them.

C. S. Bull,[4] in 1878, gave a very accurate and detailed report of a case of gumma and a complete list of the then reported cases. Since that time quite a few cases have been published, as the appended bibliography will show.

Therefore, it is strange in view of the fact which has been given above and considering the cases herein cited that this statement "but few cases of gumma of the conjunctiva are on record" should appear in the American Text-Book of Genito-Urinary Diseases, page 702. This certainly is true as pertaining to the caruncle, but indeed not with reference to the conjunctiva—ocular or palpebral. The idea the writer wishes to convey is that gumma of the conjunctiva is not such an exceeding clinical rarity as the books would have us believe, although it is not an every day syphilitic manifestation. What may be considered as a rarity, in addition to gumma of the caruncle, is a syphilitic thickening of the conjunctiva as a secondary manifestation. This thickening as a tertiary symptom is by no means as rare as the above. Perhaps some of the syphilitic blotches heretofore mentioned can be classified as secondary conjunctival thickenings.

Another point of interest in these gummata of the conjunctiva is the time of their appearance. Several have been noted as early as eighteen months after the primary lesion. Then again several years have intervened, even as many as twenty. Lawford[14] (Trans. of the Br. Ophthal. Soc., Vol. II., page 38, and reviewed in the Ophthalmic Record, Vol. 7, page 630) reports one of these tardy-appearing gummata. However, the average time of appearance is about three to five years after the initial lesions. Likewise, the location of the gumma is of interest. By far the greater majority ap-

pear in the lower ocular half, though it is asserted that a good many have their origin in the upper palpebral conjunctiva, and from here invade the ocular portion. Still in analyzing the cases reported you will find that a more or less extensive chemosis and swelling, as well as an induration, existed in the palpebral conjunctiva, which may have given rise to errors in judgment as to the exact origin.

Superficial ulceration of these conjunctival gummata are a frequent observance, as are also their cicatrization. A notable feature in this class of cases is the enlargement of the preauricular and submaxillary glands, mention of which has already been made above. The enlargement of these glands aids the diagnosis materially.

With reference to the extent and size of these gummata, it may be said that they vary from the size of a pea to that of an almond. The usual starting point for these conjunctival gummata is in the tissue of the upper lid or directly at the fornix conjunctivæ. From here the tendency is downward, and at the same time a chemosis of the ocular and palpebral conjunctiva ensues. Yet quite a few start in other parts of the bulbar conjunctiva which have no direct connection with the lids, *e. g.*, they appear in the immediate neighborhood of the cornea. The gumma of the caruncle starts in the caruncular tissue proper.

The diagnosis of a gumma of the caruncle or conjunctiva is not at all difficult if the pre-auricular glands are enlarged and a history of a syphilitic infection or taint can be elicited. The gumma in either location responds readily to the specific treatment—another aid in diagnosis.

The following is the case of which mention has been made above: Mr. J. D., æt. 22, pugilist, was struck on the left temple during a "match." As a result, there was considerable swelling of the face and cheek of that side. Some few days later there appeared in the inner canthus of the left eye a small growth, with a mild chemosis of the lower conjunctiva. This tumor was lodged in the caruncle. About a week later he noticed that the upper lid was thickened, and on everting the lid and turning the eye down a small tumor was seen springing from the substance of the bulbar conjunctiva. Both tumors rapidly increased in size, so that within three

weeks after being first observed the tumor in the caruncle was as large as a good-sized pea, while that of the upper conjunctiva was as large as a medium-sized bean. Both felt hard to the touch; no pain or discharge nor visual impairment was present. Almost synchronous with the appearance of the tumors, the pre-auricular and submaxillary glands became enlarged and painful. The conjunctival chemosis was very great and the conjunctiva rolled out in folds upon the lower lid to quite an extent.

This was his condition at the time he was referred to me. A few days later a superficial ulceration at the intermarginal edge appeared on the gumma springing from the bulbar conjunctiva; none was observed on the portion from the caruncle. The internal edge of the gumma from the upper half of the conjunctiva crowded underneath the caruncle gumma, yet no connection whatsoever existed. They remained throughout the course of their existence as two separate and distinct tumors. At first the patient vigorously protested against a specific infection, but after persistent inquiry and a thorough physical examination, a confession as well as undeniable stigmata were elicited. He had contracted syphilis five years previously. The right eye was normal and no other lesions than the ones mentioned were found in the left. He was given rapidly ascending doses of potassium iodide, the maximum daily amount being 200 grains. In addition, he received a drachm of mercurial ointment as inunctions per day and closely watched. After four weeks of this treatment, the gummata entirely disappeared, as did the preauricular and submaxillary swellings. At no time during the treatment were there any symptoms of iodine or mercurial poisoning.

The points of interest in this case may be given as follows:

1. The characteristic preauricular and submaxillary glandular swelling, developing pari passu with the gumma.
2. The distinctness of the two gummata.
3. The unusual size of the caruncle gumma.
4. The infrequency of gumma of the caruncle.
5. The usual time of appearance of the gumma, namely, five years after the initial syphilitic lesion.

The appended bibliography is well nigh complete with

reference to gumma of the bulbar conjunctiva and caruncle. It also shows that a gumma of the conjunctiva has not been such an exceeding clinical rarity, while it does show the scarcity of gumma of the caruncle. Though the paper does not make any reference to chancre of the ocular conjunctiva, yet references thereto have been incorporated in the bibliography for the reason that a chancre is almost as rare as a gumma. The purpose of this is to show the relative frequency of these various syphilitic lesions of the conjunctiva.

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PAMPHLETS RECEIVED.

"The Cosmetic and Visual Results in Squint," by J. M. Ray, M.D.

"Cleft Palate and Its Relation to Speech," by G. H. Makuen, M.D.

"Is Astigmatism, like Myopia, Ever Progressive?" by G. C. Pardee, M.D.

"Devitalized-Air-Toxæmia a Prime Cause of Tuberculosis," by Ch. Denison, M.D.

"The Relation of Out-Door Life to High Altitude Therapy," by Ch. Denison, M.D.

"The Diagnostic Importance of the Examination of the Feces," by Ch. D. Aaron, M.D.

CORRESPONDENCE.

WAS HELMHOLTZ THE ORIGINAL DISCOVERER OF OPHTHALMOSCOPY?

WASHINGTON, D. C., Feb. 26, 1902.

Editor AMERICAN JOURNAL OF OPHTHALMOLOGY:

Dear Doctor:—The chief and indeed the only point of difference between Dr. Theobald, so far as his recent contributions show, and myself, regarding the position of Helmholtz as the discoverer of ophthalmoscopy, seems to be this: Dr. Theobald esteems whatever was original in this discovery not to the credit of Helmholtz, and that whatever Helmholtz did was the result of a lucky chance and through a misconception of some law of optics, not clearly indicated; while I, in common, as I had supposed, with the whole of mankind informed on the subject, look upon Helmholtz as the sole author of the most brilliant scientific achievement of the century in which he lived, being, as it was, the outcome of a carefully wrought out theory based on the known laws of optics, which theory, when applied, proved in every particular its justification.

The reasons for my so thinking are, I believe, clearly set forth in my former communication in your journal. The authorities for my belief have been derived mainly from the very highest source—namely, Helmholtz himself, and not from his biographers or commentators, and I cannot but regard them as convincing to the unprejudiced.

As Dr. Theobald, however, is of the same opinion still and wishes for further enlightenment on some points, I have to beg your indulgence and that of your readers for a few additional lines on a subject about which there should be no two opinions among ophthalmologists of to-day.

Firstly, regarding the illumination of the background of the eye, which Dr. Theobald considers the "fundamental problem of ophthalmoscopy." It must be confessed that, in order for an object to be seen, it must be illuminated, and, further, in order that the eye be illuminated, it is necessary

to bring into play the laws of reflection by reflecting surfaces and of the refraction of light by curved surfaces, all of which would take us back on these lines, for the real discoverer of ophthalmoscopy, to the region of very ancient history. According to this reasoning, Volta should be credited as the original inventor of the telephone and wireless telegraphy. To the discovery of the means of illuminating the bottom of the eye Helmholtz made no claim. He found it a part of the general knowledge of science when he came to teach physiology, dating back as far as Prevost's time in 1810, and he was familiar, as he has stated, with all the investigations on that subject from that time up "to 1847, when I began to search for the ophthalmoscope."* As he did not succeed in finally seeing the interior of the eye until 1850, it would seem that the lucky chance was considerably deferred.

"In my lectures," he says (*l.c.*), "I had to give an account of these investigations and try to give an explanation of the phenomena. I was obliged therefore to seek an explanation myself, and I may say that it was not difficult to find—at least for a man who had occupied his time with reading physics and chemistry and in making experiments as far as his scanty means would allow. Being acquainted with the principles of optics as far as they were then known, I proceeded to analyze the course of the rays of light in the experiment just alluded to and thus reached an explanation of the phenomena, the correctness of which was afterwards confirmed by the ophthalmometer."

Up to that time the illumination of the pupil had not been considered as of any scientific value, but, "as an entertaining experiment in a social gathering, and students had applied it to frighten young ladies."

Millions of people before Newton had seen an apple fall to the ground, but none had set himself to the task of finding out why it fell, and the law governing its falling. No one before Helmholtz had ever put the question to his mind

*Address published in Med. Record, N. Y., Dec. 16, 1893.

[1]By which he means that the ophthalmometric measurements which he subsequently made, demonstrating the refractory power of the eye, substantiated the theory he had worked out as to the paths followed by rays of light emerging from the eye.

why, if the light entering the eye serves as a source of illumination, cannot this light be used in such a manner as to produce optic images of the objects so illuminated? "All my predecessors," he continues, "had failed to put that question to themselves. They had stopped in the middle of their way instead of going on to the end." To repeat a paragraph quoted from him in my other paper: "The eye to be observed, having been rendered luminous, there was only a second condition to be fulfilled, namely, to make it possible for the eye of the observer to accommodate itself to the focal distance of the one to be observed." This is the original thought of Helmholtz, and of Helmholtz alone, and this is the sole basis of ophthalmoscopy. No one had ever before considered it necessary to regard the eyes of the observer and the observed as two optical instruments which had to be adjusted to one another, in order that distinct images should be formed on the retina of the observing eye. This was but an application of the well-established laws of optics as they presented themselves to his philosophic mind. "As soon as I had answered this question, I also saw how an ophthalmoscope could be constructed, and it took me only two days to do it and to successfully experiment with the new instrument."

It will be observed from this account by the principal actor himself that the method followed was strictly philosophical. He first worked out the theory in accordance with scientific principles, then made an application of it by means of a mechanical contrivance and the truth of the conception was demonstrated. He did not accidentally discover that, by means of an instrument he happened to be using, he had an image of the background of the eye and then explained why it was so. As Prof. Hirschberg said at the celebration of the discovery of ophthalmoscopy, before the Medical Society of Berlin: "The matter of supreme importance was the exactness (Klarheit) of the theory. This up to the present time has remained absolutely unchanged. Of how many of the theories of 1850 can this be said?"

The second question that Dr. Theobald asks for solution is: If it was not through a misconception, what led Helmholtz to employ only concave lenses in his ophthalmoscope? To

some who have not read Helmholtz's original monograph or who have read it and have stopped half way without going on to the end to find out what his purpose really was, it might seem perplexing that he should have used only the converging pencil of rays coming out of the observed eye, and the inquiry is not impertinent to the subject and is deserving of consideration. Helmholtz, though one of the most clear-minded of men, and the most simple and direct in his explanations, yet necessarily presupposed a modicum of knowledge and thought on the part of his readers. No one knew better, nor indeed as well, at that time, as he of the different paths rays of light might take in coming out of an illuminated fundus, depending, as they would, upon the point upon which the eye happened to be accommodated (*Adaptationsweite*).[2]

The "Adaptationsweite" was the basis of all his reasoning on the subject, and it was his knowledge of this fundamental fact, which all others had overlooked, that enabled him to find a law for a solution of the question in hand. For the simple application of this law, however, he chose to take only one kind—the converging pencil—because it was the one most commonly present either in the form of myopia or through the act of accommodation, but more largely probably because it was in keeping with the explanation he was endeavoring to make of the illuminated pupil and the reasons why, in these experiments, the fundus of an observed eye was not, under ordinary circumstances, visible. These reasons he conceived, and most rightly, to be the fact that the retina and the source of illumination were conjugate foci and the source of illumination was always at a finite distance. He therefore took as the point of adaptation a finite distance deliberately and not as a happy accident. This fulfilled the law as perfectly as either parallel or divergent rays. That we have taken parallel rays and an infinite distance as our standards at this day is merely a matter of more practicable adaptability and not because it is more scientific.

That the subject in all its bearings and possibilities in respect to the different refractive states of the eye was per-

[2]Helmholtz had to invent words to suit the new conditions he was dealing with, and it may be well to explain that he used the word "Adaptationsweite" in much the same sense we now use "far point" as the conjugate focus of the retina.

fectly clear in his mind is shown in the short paragraph in which he outlines the whole question of the determination of refraction of the eye by the direct method of opthalmoscopy, to the theory of which we have added nothing from that time to this. After showing how it can be demonstrated that the distinctness of the image of the fundus changes with each adaptation of the observed eye for different distances, due to a change in its refractive condition, he says (page 38 of his original monograph):

"Moreover it is possible, if deemed necessary, to easily determine objectively, by means of the ophthalmoscope, the existence and degree of near- and far-sightedness (Kurz- und Weitsichtigkeit) in the observed eye. The observer first examines a normal eye which he causes to fix objects placed at different distances and determines the concave glass which it is necessary to use for each degree of accommodation (Adaptationsstufen). In examining any other eye he then learns from the number of the concave glass, through which the retina is distinctly seen, the corresponding far point (Adaptationsweite) of the eye under observation." He then relates an instance in which he had determined a high degree of myopia in an amblyopic eye by this method.

All this seems so simple and easy to us now! And it is scarcely to be wondered at that there should be some who are ready to think that after all it didn't really amount to much in the way of originality, that it was a mere matter of accident or misconception of some sort, and that, because he didn't do it with a Loring ophthalmoscope with a full equipment of plus and minus lenses, he didn't fully realize what he was about.

Still I can not help but think that it is not altogether seemly in us, in the plenitude of our present knowledge and the plainness of the paths we now follow, to forget the trackless ocean upon which Helmholtz embarked on his voyage of discovery of the unknown land of ophthalmoscopy a half century ago, and to fail to honor him duly for his wisdom and his trust in the laws of physiological optics, which he perhaps more than any other one man has helped to establish for the sake of science and the benefit of humanity.

Yours very truly,

SWAN M. BURNETT.

MEDICAL SOCIETIES.

PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.*

DAVID LITTLE, M.D., F.R.C.S.E., President, in the Chair.

Thursday, January 30, 1902.

DR. C. O. HAWTHORNE read a paper on intracranial thrombosis as a cause of double optic neuritis in cases of chlorosis.

SIR WILLIAM GOWERS thought that the evidence of thrombosis in these cases of chlorosis was very small indeed.

MR. JOHNSON TAYLOR asked Dr. Hawthorne how, if the cavernous sinus were thrombosed, it happened that there was no proptosis. He thought it more likely that it was due to some blood change.

DR. JAMES TAYLOR agreed with Sir William Gowers. Although the cavernous sinus might not be blocked, yet some of its tributaries might be, and this might account for the neuritis; but he thought that it was very difficult to see what caused it on both sides. Blocking of the arteries certainly did not cause it unless the embolus was septic.

MR. ERNEST JONES read notes of a case.

DR. HAWTHORNE, in reply, said that some chlorotic patients died who suffered from optic neuritis, and in these there was nothing but thrombosis present to account for it. He thought that the block need not necessarily be in the cavernous sinus, but if it were he should expect proptosis.

THE TREATMENT OF CYSTOID CICATRIX FOLLOWING CATARACT EXTRACTION.

MR. G. A. BERRY read a note on this subject. He said it was not always possible to prevent the formation of cystoid cicatrices after removal of cataract, and when they did occur they were a source of danger to the eye on account of the way they facilitated the entrance of micro-organisms. The

*British Medical Journal.

author had found that it occurred in about 2 to 3 per cent. of cases operated upon. As a rule, the opening was very small, and could be seen readily if the conjunctiva were dissected up. For the treatment he preferred to dissect up the conjunctiva and turn it down as a flap, then with the cautery gently to burn the small opening, and at once replace the conjunctival flap. This always cured it, and he preferred this method to any other that had been introduced.

Endothelioma of Orbit.

Mr. Simeon Snell (Sheffield) related a case of endothelioma of the orbit, associated with a peculiar varicose condition of the vessels of the surface of the eyeball, occurring in a girl, aged 19. A marked feature was the varicose condition of the veins on the surface of the eyeball below, which had first been noticed about three months before the date of operation. There was also marked proptosis, the left eye being about a quarter of an inch in advance of the right. There was no œdema of the eyelids. The smooth surface of the tumor was felt in the floor of the orbit. Movements of the eyeball were normal except downwards, where there was some limitation. Vision was $^{6}/_{6}$. On October 28, 1901, the entire tumor was removed through an incision in the lower lid, without interfering with the eyeball. It had only loose attachments; it reached to the back of the orbit close to the under surface of the eyeball, and along the front part of the optic nerve. It was encapsuled, and measured an inch and a quarter long and about half an inch thick. The eyeball had since resumed its normal appearance, the varicose condition of vessels had disappeared, and vision was $^{6}/_{6}$. Mr. Treacher Collins examined the growth, and reported it to be an endothelioma.

Ringworm of the Eyelid.

Mr. Simeon Snell related a case of ringworm of the eyelid in an adult, due to a large spored trichophyton, probably of animal origin, occurring in a healthy agriculturist, aged 34. He was first seen on December 17, 1901, with a large red patch on the right eyelid, which had commenced two weeks before as a rounded, brownish-red pimple on the skin

near the outer canthus. It gradually increased in size, and now measured 2 inches by $1^1/_4$ inch. It was oval in shape, with pustular points and well-defined edges. It involved the outer half of the upper eyelid, reached to the temple, embraced the outer commissure and the outer corner of the lower eyelid. The affected eyelashes and hairs of the eyebrow had fallen out or were loose. The preauricular gland and gland beneath the jaw were involved. There were six other lesions on the right forearm and two on the left. In all the patches there was marked loss of hairs. The patient kept cows, and one had on the left side a white patch without any hair on it for about two months. The ringworm apparently commenced on the right arm and the eyelid became affected by contact, the man working with his bare arms. Under the application of yellow mercurial oxide ointment improvement soon commenced, and on January 30th the patches on the arms had practically disappeared, and the one on the eyelid was only distinguishable by its greater redness. Under the microscope a large spored fungus was found, probably megalosporon ectothrix. Cultures from the hairs removed from the cow were not successful.

The Visual Purple of the Retina.

Dr. F. W. Edridge-Green read a paper entitled Observations on the Visual Purple of the Retina. The expenses of the research were defrayed by a Government grant of £10. He undertook the investigation in order to ascertain whether he could obtain any objective evidence of the diffusion of the visual purple into the yellow spot of the retina. Many phenomena pointed to this conclusion, such as the fact that a perceptible interval elapsed before people were able to see with the yellow spot, and that a light might fall on the fovea without producing any sensation. His first experiments were made with the help of Mr. Treacher Collins. On examining the retina of a monkey, it was at once evident that the visual purple extended to the yellow spot, but the very deep yellow of the spot prevented them from saying with certainty that the color altered on exposure to light. Mr. Treacher Collins and he had tried numerous chemicals in order to find out a substance which would fix the visual purple, but had not been

successful. Nearly every chemical he used destroyed the purple. He then examined the eyes of two monkeys by himself, and tried to obtain an early view of the yellow spot of the retina through a microscope. It was at first red and then gradually bleached under the influence of light. He noticed a curious appearance in one retina; on examining the region just external to the yellow spot, he saw rose-colored cones surrounded by one or more circles of colorless rods. His last observations were made with the help of Mr. Devereux Marshall. Two monkeys were kept in a dark room for twenty-four hours, and then Mr. Devereux Marshall excised their eyes under chloroform, the room being illuminated only by a ruby light. The retina, having been arranged on a slide, was put on the stage of a microscope and viewed with a white light. The whole retina was bright crimson, but the brightest part of all was the yellow spot, and it could be seen that the visual purple was situated between and not in the cones in the rod-free district of the yellow spot. The visual purple in a few minutes bleached, leaving the yellow spot in its usual yellow color. Dr. Edridge-Green expressed his great indebtedness to Mr. Treacher Collins and to Mr. Devereux Marshall and also to Professor Starling for the use of his laboratory and the very admirable dark room at University College.

Card Specimens.

The following were shown: Mr. George Keeling: Unusual Refractive Change after Removal of a Congenitally Dislocated Lens.—Mr. H. R. Belcher Hickman: A Case of Retinitis Proliferans.—Mr. G. W. Roll: A Congenital Anomaly of the Optic Disc.—Mr. A. W. Ormond: A Case of Double Anophthalmos.—Mr. J. H. Parsons: Microscopic Sections of Pseudo-Glioma due to a Congenital Membrane.—Mr. Inglis Taylor: Fenestrated Metallic Balls Used by Professor Pflüger in Mules' Operation.—Mr. Holmes Spicer: A Case of Third Nerve Paresis with Argyll-Robertson Pupil and Marked Association of Convergence and Contraction of the Pupil.—Mr. R. Marcus Gunn: Unusual Deposit on Inner Surface of Each Cornea of Recent Origin and Slow Development.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.
ST. LOUIS, MO.

RESULTS OF X-RAY DIAGNOSIS AND OF OPERATION IN INJURIES FROM FOREIGN BODIES IN THE EYE.

William M. Sweet (*Phil. Med. Journal*, Feb. 1st), from a study of sixty-five cases in which he located a foreign body in the eye or orbit, by means of the Röntgen rays, draws the following conclusions:

1. The Röntgen rays offer the most certain method of detecting and locating foreign bodies in the eye.

2. The position of the foreign body should be determined in all cases before magnet extraction is attempted. Frequent insertion of the small magnet into the vitreous in the hope of finding the metal injures the eye and renders later attempts at extraction difficult, while the employment of the large magnet is not without danger when the position of the body is not known.

3. Early extraction offers the best chance of saving the eye. When the track of the body is through the cornea and lens, its position in the vitreous will indicate whether less damage will be done by removing the metal through the open entrance wound or through a new opening in the sclera close to the indicated position of the body.

4. The more extended use in the future of the larger magnet, in cases of steel in the vitreous chamber, to draw the metal to an opening in the sclera, after its position has been accurately determined, will probably achieve better visual results than have been obtained in the past with the small magnet introduced into the vitreous.

5. Iron or steel which has remained in the eyeball until a fibro-cellular covering envelops it cannot be dislodged with the magnet. Extraction with forceps, and the employment of normal salt solution to replace any vitreous lost, has resulted in several instances in eyeballs of good cosmetic appearance,

and is an operation worthy of trial. Forceps extraction must also be employed when the body is of copper or glass.

6. Extraction is a safe operation, and under proper precautions is free from the dangers of panopthalmitis or meningitis.

THE IDENTIFICATION OF CRIMINALS THROUGH THE FUNDUS OF THE EYE.

M. F. Weyman (*Journal of the American Medical Association*, Feb. 22) thinks that absolute identification can be obtained by a drawing of the papilla and the central portion of the retina. So great is the variety of the anatomical relations of the vascular twigs, that the author has never found two fundi alike.

REFLECTIONS ON OPHTHALMIC WORK IN THE ARMY.

John Grimshaw (*British Medical Journal*, Jan. 18) reviews his experience with recruits and makes the following suggestions:

1. Do not admit more ametropes by still further lowering visual tests unless prepared to correct their vision.

2. The examination of such ametropes by ophthalmic experts (civilians or military) and their vision and correction to be recorded on their medical history sheets. Such action would be necessary not only to treat the 'scrimshanking and discharge' stage of a soldier's *folie circulaire*, but to render easy the replacement of broken or lost glasses.

3. Opticians to be officially appointed whose duty it would be to keep an exact record of glasses supplied, to check the regimental data.

4. The distribution of recruits according to their sight to branches of service not necessitating keen vision or otherwise. If the visual tests were lowered, it would be of paramount importance to separate the 'hewers of wood and drawers of water' from the soldier who proposes to become a good rifleman, cavalryman, or artillerist.

5. To support discipline, and to lessen the responsibility of medical officers by inflicting summary punishment—by courtmartial and under the certificate of the ophthalmic

surgeon—on soldiers afflicted with *folie circulaire* of above type.

6. To encourage the correction of ametropia by granting spectacles to soldiers free of cost. I never could understand why free spectacles were given to South African invalids conditional on their discharge from the army. I should have thought that a non-discharge was a more rational condition. The War Office grants artificial teeth to men who are likely to become efficient soldiers and who are willing to remain in the army. Why not spectacles?

7. Official encouragement to R. A. Medical Corps officers to specially qualify themselves in ophthalmic work, such special qualifications to be rewarded with corresponding increase of pay.

8. The appointment of civilian consultants in certain military centers or districts to co-operate with the R. A. M. C. officers as occasion demanded or rendered desirable.

Special arrangement to be made whereby spectacles lost or broken can be replaced, and for ensuring suitable glasses being always available on occasions of need. This applies specially to men abroad or on active service.

PAMPHLETS RECEIVED.

"Anisometropia," by A. Duane, M.D.

"Dermoid Tumors," by V. D. Foster, M.D.

"The Diagnosis of Ocular Paralyses," by A. Duane, M.D.

"A Case of Unusual Tertiary Manifestations," by G. H. Makuen, M.D.

"Speech as a Factor in Diagnosis and Prognosis of Backwardness in Children," by G. H. Makuen, M.D.

"The Prevention of Blindness by the Adoption of Laws Compelling Hygienic Precautions," by D. V. Johnson, M.D.

"Miscellaneous Ruptures of the Choroid and Paretic Mydriasis without Paresis of Accommodation," by A. Duane, M.D.

"Empyema of the Right Maxillary, Ethmoidal and Sphenoidal Sinuses, with Sudden Blindness of the Left Eye; Operation; Recovery of Sight," by T. H. Halsted, M.D.